

TABLE OF CONTENTS

<u>Page</u>	No.
Acknowledgments	
INTRODUCTION AND BACKGROUND	
DESCRIPTION OF THE WATERSHED AND EXISTING AQUATIC HABITATS	
Topography and Geology Major Streams and Drainage Patterns	
FISH COMMUNITIES	8
Historical Accounts	
FISHERIES MANAGEMENT WITHIN THE WATERSHED Fish Stocking Regulations Angler Access	14
BARRIERS TO FISH PASSAGE	18
CONCLUSIONS AND RECOMMENDATIONS	19
REFERENCES	20
LIST OF TABLES	
Table 1. Fish found in Oneida Lake tributaries in 1927.	
Table 2. Recent fish collections from the Cowaselon Creek watershed.	
LIST OF FIGURES	
Figure 1. Topographic view of the lower portion of the study reach encompassing Cowasel Creek, the Douglas Ditch, and Canaseraga Creek.	on
Figure 2. Aerial photograph of the lower portion of the study reach encompassing Cowase Creek, the Douglas Ditch, and Canaseraga Creek.	lon
Figure 3. General topography of Cowaselon Creek Watershed.	
Figure 4. Major streams of the Cowaselon Creek Watershed.	
Figure 5. Cowaselon Creek/Douglas Ditch water temperatures.	

- **Figure 6.** General trout stocking locations within the Cowaselon Creek Watershed.
- Figure 7. Areas closed to angling in the spring to protect spawning walleye.

PHOTOGRAPHS

Photo 1. Cover photo taken by Kevin Bliss, New York State Department of Environmental Conservation, Syracuse, NY.

APPENDICES

- **Appendix A.** Fishes of the Cowaselon Creek Watershed
- Appendix B. Site Specific Sampling Efforts
- Appendix C. Photos of the lower portions of Canaseraga Creek and the Douglas Ditch

Acknowledgments

The author would like to thank all of the biologists from the U.S. Fish and Wildlife Service's New York Field Office including Alex Chmielewski, Molly Connerton, Eric Rozowski, Chris Hamilton, Steve Patch, Bill Lints, and volunteer, Shannon Nayyar for their assistance with the field work. Thanks are also given for the additional field assistance from the Lower Great Lakes Fishery Assistance Office's Chris Lowie, the Great Swamp Conservancy's Mike Patane, and the New York State Department of Environmental Conservation's (NYSDEC) Kevin Bliss. Madison County Planning Department's Scott Ingmire was very helpful in locating sample sites and their owners through the use of the County's global information system (GIS). Additional thanks are given to the following landowners for access to their properties: John Patane, Dominick Perretta, and Richard Carrier. The author is indebted to the U.S. Geological Survey's Dick McDonald for his assistance with GIS mapping for the project and to the NYSDEC's Jeff Robins for his review and recommendations for several sections of the report. Finally, gratitude is expressed to Megan Patch for her assistance in editing and word processing of this report. The critical reviews from Anne Secord, Laury Zicari, and David Stilwell greatly assisted in composing the final document.

This study was funded by the U.S. Fish and Wildlife Service under the Federal Aid in Sport Fish Restoration reverted funding.

INTRODUCTION AND BACKGROUND

The southern flank of Oneida Lake's floodplain is composed of a huge wetland system known by the Oneida Indian Nation as the Great Swamp (**Figures 1** and **2**). The Cowaselon Creek watershed encompasses the eastern end of this area spanning approximately 22,230 acres (9,000-hectares [ha]). Historically, the wetlands and streams of this watershed likely provided diverse aquatic habitats for many of Oneida Lake's fish species and may have served as important spawning and nursery areas. However, the construction of numerous ditches and the installation of drainage tiles during the late 1800's through the 1950's allowed the rich, organic muck soils to be used for agriculture (Madison County Planning Department, 2001). Valuable wetlands and aquatic habitats were significantly altered during this period, severely reducing, and in many cases precluding, their continued use and benefits to the fish and wildlife resources.

As the fertility of the muck soils deteriorated, agriculture was abandoned and many farm fields reverted to old field vegetation. Today less than half of the original area is still in agricultural production. The Natural Resources Conservation Service's (NRCS) Wetland Reserve Program has enrolled 3,567 acres (1,441 ha) in the Canastota Focus Area; this represents conservation easements with 60 landowners and restoration activities on 25 sites encompassing nearly 1,000 acres (404 ha)(personal communication with Michael Welshko, NRCS, Madison County, NY). The U.S. Fish and Wildlife Service's (Service) Partners for Fish and Wildlife Program has worked with 24 landowners and restored 311 acres (125.6 ha) of wetlands and 299 acres (120.8 ha) of grassland and riparian habitats in the Oneida Lake watershed of Madison County. One of the Service's major partners in habitat restoration is the Great Swamp Conservancy, an organization that has developed a nature center and plays an active role in wetland education.

Wetland restoration and enhancement in the study area have benefitted many species of wildlife; however, the functional uses of this habitat by fishery resources have not been assessed. Drainage ditches and associated laterals interconnect with Cowaselon Creek at the Douglas Ditch. However, these interconnections may themselves present obstacles precluding fish from accessing affected stream reaches and restored wetland areas. The ditches used to drain the area can result in seasonally low water levels which can preclude fish movements. In addition, there are elevational differences between the laterals and the Douglas Ditch which may serve as a gradient barrier to fish passage.

This report provides information which: describes the watershed's existing aquatic habitats; documents historic and existing fish communities; discusses existing fisheries management; evaluates opportunities for angler access and use within the watershed; and, discusses barriers to fish passage. This study was funded by the Service under the Federal Aid in Sport Fish Restoration reverted funding. It began during 2001 with field surveys continuing through 2003. The results of this study provide baseline fisheries information vital to the continuing restoration of the Cowaselon Creek watershed.



Figure 1. Topographic view of the lower portion of the study reach encompassing Cowaselon Creek, the Douglas Ditch, and Canaseraga Creek. Note the significant number of ditches (straight blue lines) leading to the Douglas Ditch.

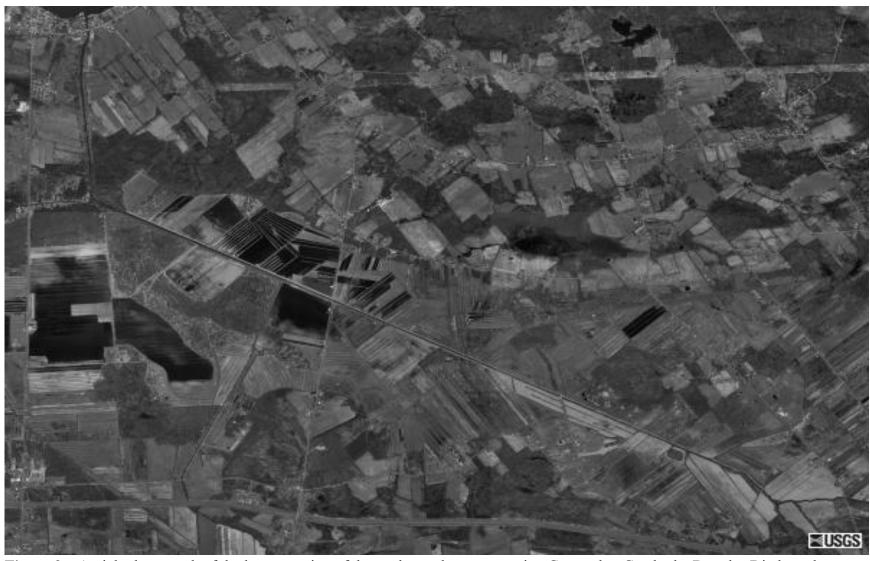


Figure 2. Aerial photograph of the lower portion of the study reach encompassing Cowaselon Creek, the Douglas Ditch, and Canaseraga Creek.

DESCRIPTION OF THE WATERSHED AND EXISTING AQUATIC HABITATS

Topography and Geology

The Cowaselon Creek watershed lies entirely within Madison County, New York. The drainage basin is located within two of New York's major physiographic provinces: the Appalachian Uplands/Plateau to the south and the Ontario lowlands, or more specifically Oneida Lake Plain, to the north (**Figure 3**). The Helderberg Escarpment forms the border between the plateau and the low-lying plains. The escarpment has steep, north-facing slopes with nearly vertical outcrops of exposed limestone bedrock in some places. This area of higher elevation (approximately 1,300 to 1,600 feet [396 to 489 meters] above mean sea level [msl]) represents the northern terminus of the Appalachian Plateau¹. The headwaters of Cowaselon Creek, including Clockville, Canastota, and Canaseraga Creeks, originate in the uplands and flow north descending the escarpment onto the Oneida Lake Plain.

The *Soil Survey of Madison County* (Hanna 1981) described the plateau as mature and eroded, dissected by a series of valleys that are several hundred feet deep. The major valleys on the plateau have a north-south orientation. The lower portions of the plateau are characterized by rolling or undulating terrain with some areas of large drumlin-like hills and ridges. Due to stream dissection and the deepening of valleys by glacial scour, the plateau uplands have a rugged, rolling appearance. Streams in this reach are fairly steep, flowing northward through large cobble and gravel deposits.

Past glaciation events dramatically shaped the area's landscape, creating a large floodplain south of Oneida Lake consisting of low-lying wetlands known by the Oneida Indian Nation as the Great Swamp. The northern subsection has a low, nearly level, old glacial lake bed topography with gently sloping beach ridges in some places. The southern subsection is more sloping with outwash terraces and lacustrine benches interspersed by low, till-covered hills.

Downstream of the City of Canastota (City), and in the vicinity of the City's waste water treatment plant, Cowaselon Creek becomes a well defined dug channel known as the Douglas Ditch. Near the downstream end of this ditch, Canaseraga Creek enters this channelized segment. From that point on, the waterway takes on the name of Canaseraga Creek and flows into Oneida Lake at Lakeport, New York. The lake's normal pool elevation is about 369 feet (112.5 meters) msl. There is only about a 50-foot (15.2 meters) increase in elevation from the lake to the City. However, south of Canastota, sloping hills arise and elevations increase. The immediate area of the escarpment has the most pronounced relief in Madison County. In this area the ground elevation rises more than 250 feet (76 meters) in a very short horizontal distance.

Major Streams and Drainage Patterns

A morphological delineation of stream types (Rosgen 1996) within the Cowaselon Creek watershed is presented in this section. A Level 1 approach is used to describe the general land forms, valley types, and corresponding major stream types. An analysis of topographic maps combined with numerous field visits were used to describe the major stream types within the watershed.

¹ Though not within the immediate vicinity of the Cowaselon Creek watershed, nearby portions of the plateau rise to over 2,100 feet (640 meters) msl.

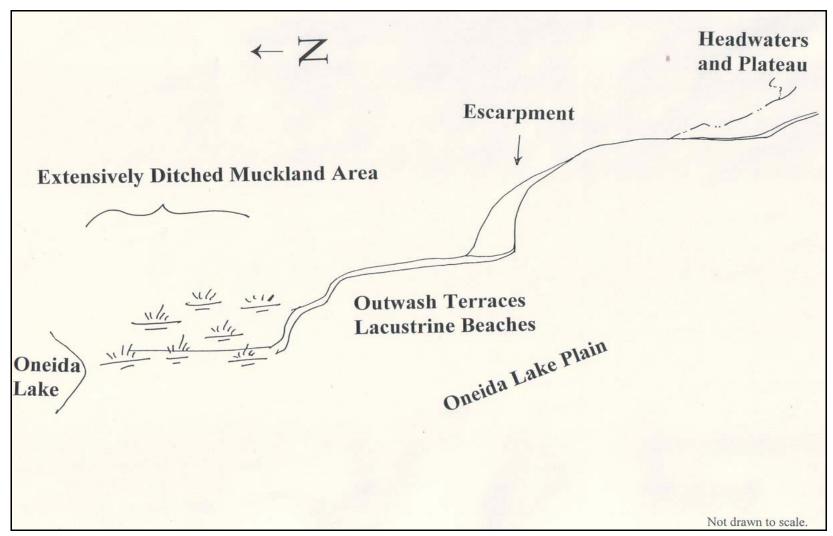


Figure 3. General Topography of Cowaselon Creek Watershed.

Hanna (1981) describes three main types of streams in Madison County. In the northern third of the county, the gradient is low and the streams meander across broad floodplains. In the escarpment and rolling hills of the southern two-thirds of the county, the gradient is very steep, valleys generally are V-shaped, and alignment is relatively straight. However, in the major valleys, streams flow on mature flood plains, the gradient is relatively low, and the alignment meanders over reworked floodplain deposits. The principal drainage pattern in the county is dendritic, though the pattern is somewhat modified in places by bedrock and by remnant glacial features. Cowaselon Creek begins within the escarpment of the Appalachian Plateau originating from small intermittent and perennial first order streams. The creek flows in a northerly direction through a steep sided valley until it is joined by Clockville Creek (**Figure 4**). In this area, hilly upland topography is prevalent and the stream displays a type "C" channel with a relatively well-developed floodplain.² The stream is slightly entrenched, relatively sinuous, and has a general slope of 2 percent or less. Instream features of Cowaselon Creek and the lower portions of Clockville Creek are characterized by sequential riffles, runs, and pools. The substrate consists of various sized cobbles and gravels with some sand present.

Clockville, Canastota, and Canaseraga Creeks are tributaries to Cowaselon Creek, which also begin within the escarpment. Near the watershed's southern boundary, these tributaries originate on steep hillsides beginning as Type "A" and "B" streams. "A" stream types are steep, entrenched, cascading, step/pool streams having high energy and debris transport. They are found in areas with high relief, yielding channel slopes of 4 to 10 percent. Perryville Falls on Canaseraga Creek and Buttermilk Falls on Limestone Creek are examples of type "A" streams.³ The "B" stream types are found on moderately steep to gently sloped terrain with 2 to 4 percent slopes. They tend to be riffle dominated with infrequently spaced pools. The upper portions of Clockville Creek, from Oxbow Park to just upstream of Clockville, are relatively steep and display a type "B" channel. After its confluence with Clockville Creek, Cowaselon Creek continues in a northerly direction passing under Route 5 near the Town of Wampsville. It then flows through a culvert under the Old Erie Canal and proceeds in a northwesterly direction through the lowland region formerly known as the Great Swamp. Significant segments of Cowaselon Creek downstream of Route 5 and the Old Erie Canal have been modified by ditching and channelization activities. In fact, Cowaselon Creek forms the central drainage channel known as the Douglas Ditch.

In the lowland areas Dutch Settlement, Canastota, and Owlville Creeks enter Cowaselon Creek. Canastota Creek's headwaters originate as primarily a type "B" stream on the escarpment near the Appalachian Plateau. After descending the escarpment the stream becomes a type "C" stream and flows into the City and through a culvert under the Old Erie Canal. A portion of Canastota Creek within the City is confined to an underground culvert for a short distance near a local swimming pool. As it leaves the City, Canastota Creek flows into the Douglas Ditch downstream of the water treatment facility.

 $^{^{2}\,}$ See Rosgen, 1996 for a more complete description of channel types.

³ Limestone Creek is a tributary to Clockville Creek.

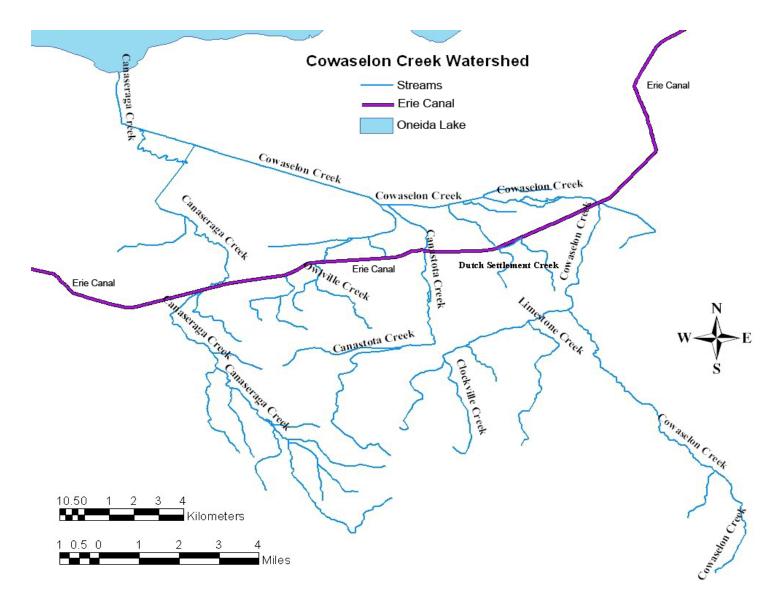


Figure 4. Major streams of the Cowaselon Creek Watershed.

Owlville Creek begins below the escarpment as a type "E" stream which has low to moderate sinuosity, gentle to moderate gradients, and very low channel width to depth ratios. This stream type can be found in a variety of land forms. Owlville Creek is associated with gentle slopes in lacustrine valleys with predominantly clay substrates. It flows through low lying areas before it enters the Douglas Ditch.

Numerous drainage ditches abound within this lowland area creating a series of laterals leading to the Douglas Ditch. The substrate within the dug channels consists of clays, sands, and small gravels. Layers of marl can be seen along several portions of mucklands associated with the Douglas Ditch. When viewed at low water levels, Cowaselon Creek appears to meander within portions of the ditch attempting to create a more natural stream form.

Canaseraga Creek originates in the southern portion of the watershed and flows northward into the lower segment of the Douglas Ditch. As previously noted, Canaseraga Creek begins as a type "A/B" stream with predominantly cobble and gravel substrates. The gradient becomes more moderate as the creek descends the escarpment and reaches the lake plain. Within this area the stream type develops into an "E" channel composed of clay, sand, and silt. The lower portion of the creek becomes channelized and flows as a drainage ditch. The creek then exits the ditch, flows for a short distance through an "E" channel, and eventually flows into the Douglas Ditch. Downstream of its confluence with the ditch, the waterway is called Canaseraga Creek, even though its drainage area and flow rate is much smaller than Cowaselon Creek.

Cowaselon and Canaseraga Creeks are listed on the Priority Waterbodies List (NYSDEC 1996) because of loss of fish habitat and elevated stream temperatures in channeled sections. Linked to this is a concern with the loss of riparian habitats. The report also indicates a substantial concern over loss of wetland habitats, especially in the lake plain and the Canastota mucklands. Further, in the upland portion of the watershed there have been problems associated with management of animal manure and contamination of surface waters. In areas of crop production, there is concern with nutrient runoff and its affects on groundwater.

FISH COMMUNITIES

Historical Accounts

In 1927, the State of New York Conservation Department conducted a comprehensive fishery survey of the Oswego River system including Oneida Lake and its tributaries (Moore 1928). The data reported did not specify individual tributaries by their names, but instead, provided a composite listing of species found in the Oneida Lake tributaries. **Table 1** provides a list of the species collected with their common and scientific names as reported at that time. Most of the specimens were collected by seining. The survey noted that the warmer the stream, the more species were present. Also, there appeared to be a gradient of temperatures ranging from cold to warm which influenced the fish assemblages. Seventy degrees Fahrenheit (21.1 C) was considered to be the dividing point between cold and warm waters. Cold water species commonly associated with trout (species not cited) included black-nosed dace, horned dace (also known as creek chub), common shiner, scuplins, common sucker, fan-tailed darter, pearl minnow, fallfish, red-sided dace, cutlips minnow, hog sucker, brook stickleback, tessellated darter, black-nosed shiner (most likely the black-nosed shiner), long-nosed dace, black-sided darter, and chain pickerel. It was noted that in no one individual stream were all of these species found in an assemblage.

Table 1. Fish found in Oneida Lake tributaries in 1927. More recent common and scientific names are indicted by ()'s.

Common name	Scientific name	Common name	Scientific name
Lake lamprey (sea lamprey)	Petromyzon marinus	Common shiner	N. cornutus frontalis
Brown trout	Salmo fario (Salmo trutta trutta)	Cut-lips minnow	Exoglossum maxillingua
Rainbow trout	Salmo irideus (Oncorhynchus mykiss)	Golden shiner	Notemigonus crysoleucas
Brook trout	Salvelinus fontinalis	Silvery minnow	Hybognathus regius
Common sucker (white sucker)	Catostomus commersonni commersoni (C. commersonii)	Blunt-nosed minnow	Hyborhynchus notatus
Hog sucker	Hypentelium nigricans	Blackhead minnow (fathead minnow)	Pimephales promelas
Chub sucker (lake chubsucker)	Erimyzon sucetta oblongus (E. sucetta)	Common bullhead	Ameiurus nebulosus
Carp	Cyprinus carpio	Tadpole stonecat	Schilbeodes gyrinus
Hornyhead	Nocomis biguttatus	Margined stonecat	Schilbeodes insignis
Black-nosed dace	Rhinichthys atronasus (R. atratulus.)	Brindled stonecat	Schilbeodes miurus
Long-nosed dace	R. catractae	Chain pickerel	Esox niger
Fallfish	Leucosomus corporalis	Northern pike	Esox lucius
Horned dace (creek chub)	Semotilus atromaculatus	Red-sided dace	Clinostomus elongus (C. elongatus)
Pearl minnow	Margariscus margarita nachtriebi	Yellow perch	Perca flavescens
Pearl minnow	Margariscus margarita margarita	Yellow pike (walleye)	Stizostedion vitreum (Sander vitreus)
Black-nosed minnow	Notropis heterolepis	Black-sided darter	Hadropterus naculatus
Spot-tailed minnow	N. hudsonius	continued	

Common name Scientific name

Rosy-faced minnow N. rubrifrons

Tessellated darter Boleosma nirgum olmstedi (Etheostoma

olmstedi)

Fan-tailed darter Catonotus flabellaris (Etheostoma flabellare)

Small-mouthed black bass Micropterus dolomieu

Large-mouthed black bass Aplites salmoides (Micropterus salmoides)

Green sunfish Apomotis cyanellus (Lepomis cyanellus)

Common sunfish (pumpkinseed) Eupomotis gibbosus (Lepomis gibbosus)

Rock bass Ambloplites repestris

Mottled sculpin Cottus bairdii bairdii

Slimy sculpin Cottus cognatus

Brook stickleback Eucalia inconstans (Culaeu inconstans)

Killifish Fundulus diaphanus menona

The 1927 survey was conducted to assist with developing stocking protocols. Within Oneida Lake, pike-perch (otherwise know as walleye), yellow perch, and smallmouth bass were stocked. Although many streams of Oneida's tributaries were stocked with trout, the records for such stockings were not disclosed. The survey reported that there was debate among the fish culturists that brook trout and brown trout should not be stocked into the same stream. It was thought that brown trout would out compete the native brook trout except in colder waters where brook trout would "hold their own."

Recent Survey Results

To determine the current species composition of the fish in the Cowaselon Creek watershed, fisheries' surveys were conducted on each of the major tributaries including Cowaselon Creek/Douglas Ditch, Canaseraga Creek, Owlville Creek, Canastota Creek, and Limestone⁴ Creek. Ease of access and land ownership influenced the actual sampling locations. Sampling began in the summer of 2001 and continued through the spring of 2003. Various gear was utilized, including boat and backpack electrofishing equipment, hoop nets, and gill nets. A total of twenty-six species was collected (**Table 2**). Eighteen of these species were reported by Moore in 1928. Pictures of the species collected are found in Appendix A and specific sampling information by location are found in Appendix B. Game fish species common to the area include brown trout, brook trout, brown bullhead, yellow perch, walleye, smallmouth bass, largemouth bass, pumpkinseed sunfish, and rock bass.

Spring, summer, and fall collections from the lower sections of the watershed (including Canaseraga Creek, the Douglas Ditch, and Cowaselon Creek) were used to evaluate the potential for fish movements between Oneida Lake and the Cowaselon Creek system. The presence of adult fish in spawning condition and/or the collection of young-of-the-year fish from typically lake dwelling species could indicate the potential for movement and seasonal use of the available habitats.

Walleye enter the Cowaselon Creek watershed to spawn during the spring. As evidence of this occurrence, a ripe male was collected in a hoop net within the Douglas Ditch during an April 2, 2002, sample. Additional gill net sampling of the ditch during the spring of 2003, failed to recover any fish. However, the New York State Department of Environmental Conservation (NYSDEC) has reportedly collected post-spawn walleye in Canaseraga Creek upstream of the Douglas Ditch in the vicinity of Tag Road (personal communication with Jeff Robins, NYSDEC, Cortland, NY). The amount of spawning which occurs in Cowaselon and Canaseraga Creeks and their contribution to the Oneida Lake walleye stocks is unknown. However, during the spring, the NYSDEC closes portions of the lower watershed to angling in order to protect these spawning fish. Walleye were also found to be present as residents in the lower portion of Canaseraga Creek downstream of the Douglas Ditch (as evidenced by the August 8, 2001, sample). Young-of-the-year walleye were not collected. Any eggs laid in the lower Cowaselon

⁴ No fish were collected in Limestone Creek at a location upstream of Buttermilk Falls when an electrofishing survey was conducted on October 25, 2002. Drought conditions were prevalent during the summer of 2002.

⁵ Walleye fingerlings and fry have been stocked into Oneida Lake to help sustain fishable adult populations that are able to withstand heavy angling pressure.

Table 2. Recent fish collections from the Cowaselon Creek watershed.

Atlantic salmon Salmon salar

Brown trout* Salmo fario

Brook trout* Salvelinus fontinalis

White sucker* Catostomus commersoni

Northern hog sucker* Hypentelium nigricans

Shorthead redhorse *Moxostoma macrolepidotum*

Common carp* Cyprinus carpio

Emerald shiner Notropis atherinoides

Blacknose dace* Rhinichthys atronasus

Longnose dace* R. catractae

Creek chub* Semotilus atromaculatus
Cutlips minnow* Exoglossum maxillingua

Brown bullhead* Ameiurus nebulosus

Yellow perch* Perca flavescens

Walleye* Sander vitreus

Logperch Percina caprodes

Tessellated darter* Boleosma nirgum olmstedi

Smallmouth bass* Micropterus dolomieu

Largemouth bass* Micropterus salmoides

Pumpkinseed* Eupomotis gibbosus

Rock bass* Ambloplites repestris

Mottled sculpin* Cottus bairdii

Trout perch Percopsis omniscomaycus

Central mudminnow Umbra limi

Gizzard shad Dorosoma cepedianum

Freshwater drum *Aplodinotus grunniens*

^{* 18} of 26 species were previously collected in the Oneida Lake tributaries in the 1927 survey.

and Canaseraga Creeks would have been subjected to drift and may have found their way to Oneida Lake. Nursery areas for these young fish are likely in the near shore areas of the lake.

Northern pike have been reported in the watershed; however, they were not collected in this survey. They too are spring spawners and are protected from angler harvest during that time by a seasonal closure. The habitat within the majority of the lower Cowaselon and Canaseraga Creeks is not especially suited for spawning or as nursery habitat since vegetated back-watered areas with flooded vegetation are rare. These types of habitats were likely historically well represented prior to the extensive agricultural drainage projects which now abound.

White suckers, though somewhat ubiquitous in the watershed, likely enter Cowaselon Creek from Oneida Lake during their spring spawning runs. Gravid females and ripe males were collected in the April 2, 2002, hoop net sampling of the Douglas Ditch. In addition, relatively large brown trout were collected in this sample. These fish are thought to be entering the lower portion of the Cowaselon Creek watershed from Oneida Lake to forage during the high runoff periods. As flows recede and water temperatures increase, these fish may discontinue their use of the available habitat found in the lower portions of the watershed. This seasonal occurrence of brown trout has also been observed in Chittenango Creek, another nearby tributary to Oneida Lake.

Vegetative control has been practiced along the low-lying ditched portions of Cowaselon and Canaseraga Creeks. This activity has removed many of the shade trees and has severely reduced the amount of woody debris within the ditches. This activity has reduced the quality of the aquatic habitats utilized by many fish and wildlife. Further upstream within the un-ditched portions of the watershed, the stream banks are generally well vegetated with overhanging vegetation which provides both shade and cover. However, some near stream vegetative control is exhibited near residential and commercial properties. Substrate within the lower gradient stream sections are typically comprised of clays, sands, and silts. Progressing upstream, the finer sediments are gradually replaced with gravels, cobbles, and coarse sands.

Several typically lake dwelling fish species which were found in the lower portions of the Cowaselon Creek watershed included gizzard shad, freshwater drum, trout perch, and common carp. The first three of these species were represented by few individuals likely indicating that they may not have been locating and utilizing preferred habitats. Numerous large carp were observed in the Douglas Ditch, though collections of them were not made. Other species associated with the lower gradient segments of the watershed include the smallmouth bass, rock bass, yellow perch, log perch, brown bullhead, cutlips minnow, shorthead redhorse, common carp, tessellated darter, and central mudminnow. Many of these species are found in Oneida Lake and may be residents of either the lake or the Cowaselon Creek watershed.

The lower gradient portions of the watershed nearest Oneida Lake were predominately warm/cool water species with the exception of the Atlantic salmon. The two salmon collected were thought to have originated from stockings which occurred in another tributary to Oneida Lake. These 12.5-inch-long (318 mm total length) fish were determined to be age 2 and were considered to have had excellent growth rates (personal communication with Les Wedge, NYSDEC, Cortland, NY). Temperatures (See **Figure 5**) throughout the Douglas Ditch were generally favorable to warm water species, although seasonal use by cold water species did occur. The Atlantic salmon collected during August 2001 were considered to be near their upper temperature tolerances.

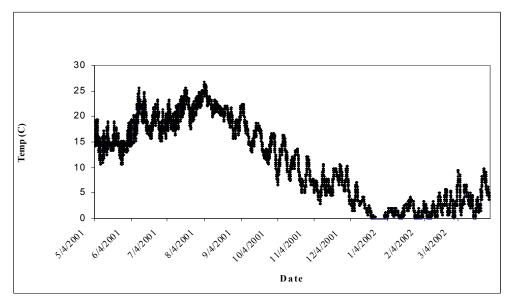


Figure 5. Cowaselon Creek/Douglas Ditch water temperatures. Five temperature recorders were staggered throughout the ditched area with no appreciable differences in temperature readings noted.

Blacknose and longnose dace are found in lower to moderate gradient reaches, while mottled sculpin and brook trout were found in the moderate to higher gradient segments. Brown trout, though not native, have become well established throughout the watershed and have likely displaced the native brook trout in many areas.

FISHERIES MANAGEMENT WITHIN THE WATERSHED

Fish Stocking

The NYSDEC regularly stocks trout into the Cowaselon Creek watershed (**Figure 6**). For example, during April 2003, the NYSDEC stocked 280, 8- to 9-inch long (203-229 mm) brown trout into Canastota Creek near Routes 5 and 13 and stocked an additional 1,030, 8- to 9-inch long (203-229 mm) brown trout into Cowaselon Creek in the vicinity of the North Court Street crossing with Route 5. Canaseraga Creek, near the vicinity of Tag Road, also receives approximately 900 brown trout annually. Madison County may also receive secondary trout stockings of lesser numbers during mid-May to June. Recent fishery surveys conducted in conjunction with this report show that brown trout have become residents throughout much of the watershed. Angler surveys have not been conducted within the watershed (personal communication with NYSDEC Fishery Biologist Jeff Robins).

Regulations

The NYSDEC provides annual fishing regulations in its **General Angling Regulations of New York's Freshwater Fishing Regulations**. There are also Special Regulations for Madison County:

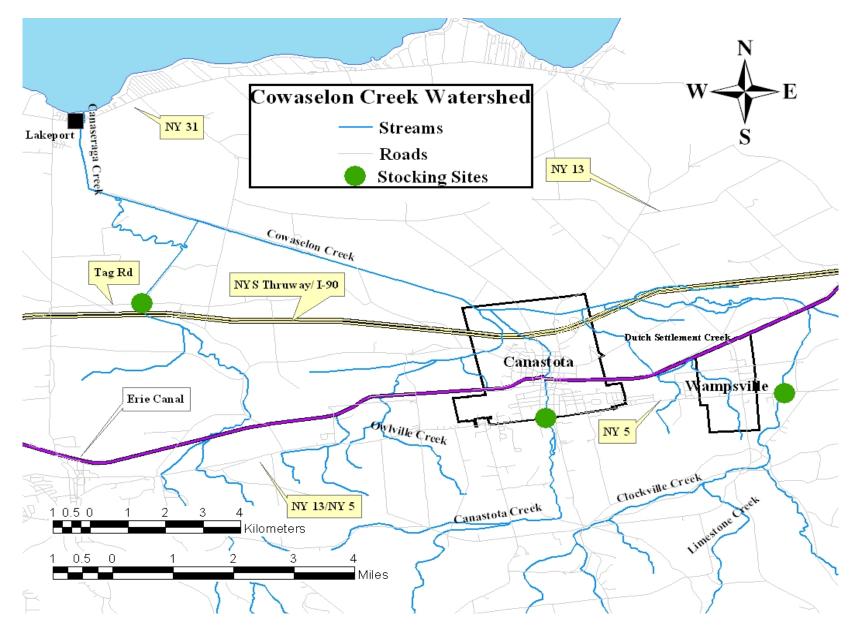


Figure 6. General trout stocking locations within the Cowaselon Creek Watershed.

A. For all trout species the open season is April 1-October 15. The daily creel limit is five fish per day with no more than two longer than 12 inches (305 mm). In addition, five brook trout less than 8 inches (203 mm) in length may be taken.

The seasonal closure provides for seasonal trout spawning, which occurs during the fall for brook and brown trout. Incubation of the eggs commences thereafter and fry emergence from gravel in the spawning area occurs in the spring. Restrictive limits, such as those regarding the keeping of larger-sized trout, are typically implemented to either reduce the overall harvest of trophy-sized fish or spread out the harvest opportunities for such fish amongst the participating anglers. Protection of these larger fish which could potentially serve as brood fish is not necessarily a management objective since the fishery is maintained by supplemental stocking. However, a substantial amount of wild reproduction of brown trout does occur throughout much of the watershed and likely contributes to the angler harvest. Finally, the regulation providing for the harvest of smaller-sized brook trout has been implemented since this species exhibits relatively slow growth rates and matures at smaller sizes within this geographic area.







Sign near Hardwood Island Road.

B. From March 16 until the opening of the walleye season in May, fishing is prohibited in Canaseraga Creek from the Route 31 bridge upstream to the New York State Thruway, and in Cowaselon Creek from the mouth upstream to Route 13.

This regulation has been implemented to protect walleye which may be concentrated in certain areas during their spring spawning activities (**Figure 7**).

Angler Access

Access to fishing areas is affected by the depth and velocity of the water and shoreline accessibility. The Cowaselon Creek watershed has a limited amount of water deep enough for a motorboat to operate. Specifically, Canaseraga Creek downstream of the Douglas Ditch to Oneida Lake has sufficient depth to allow for boating by smaller, motorized crafts (See Appendix C). Near the confluence of Canaseraga Creek with Oneida Lake there is an existing privately-operated launch, with additional launches located nearby on Oneida Lake. Although navigation within portions of Canaseraga Creek may be challenging due to fallen trees, this woody debris provides habitat and cover for game fish (See cover photo). Species such as

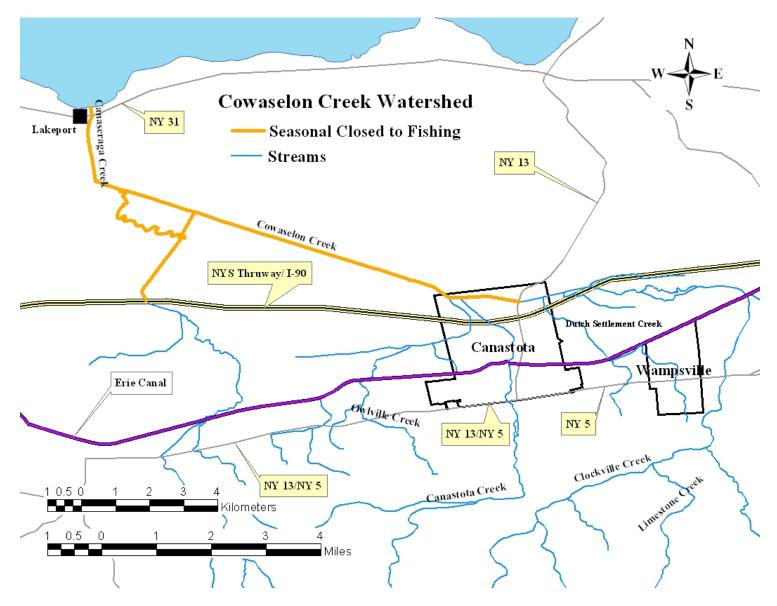


Figure 7. Areas closed to angling in the spring to protect spawning walleye.

walleye, smallmouth bass, largemouth bass, rock bass, pumpkinseed, yellow perch, and brown bullhead can be found within this reach.

Shoreline access to Canaseraga Creek is somewhat limited. By walking in from Ditch Bank Road, anglers can reach a portion of the creek downstream of the well-defined Douglas Ditch.

Forked sticks pushed into the stream banks for holding fishing rods, fire ash remains, and litter provides evidence of the area's use. Access further down the creek could be enhanced if a trail, appropriate signage, and a parking area were provided.

Within the Douglas Ditch, upstream of Canaseraga Creek, outboard motor usage is severely limited due to constraints caused by shallow depths. In addition, the bridge crossings of the ditch at Gee Road, Tackberry/Indian Opening Road, and Hardwood Island Road are armored with concrete and rock to reduce erosion and protect the bridges. Visible grade changes occur at the bridges resulting in significant water velocities making upstream passage impractical. Angling access is afforded at each of the bridges and directly from Ditch Bank Road. Fishing typically takes place along the northern side. It is likely that little wading occurs when the water is turbid and the bottom depth cannot readily be determined.

Much of the Douglas Ditch can be accessed by canoe or kayak. Since there are no formal parking areas, vehicles transporting boats and anglers must park on the shoulders of Ditch Bank Road. However, boat launching and stream side fishing can be somewhat challenging due to the relatively steep-sided banks encountered. Improvements made for parking and accessing the ditch may enhance the area's appeal to potential anglers, boaters, and other outdoor recreational users.

Within the remainder of the watershed, angling efforts focus on trout as the predominate game fish. Although there are no formally purchased Public Fishing Rights (PFR) within the watershed, informal fishing access is generally available near the trout stocking areas associated with Cowaselon, Canastota, and Canaseraga Creeks (See **Figure 7**) (personal communication, Jeff Robins, NYSDEC, Cortland, NY). Informal access for trout fishing is also found on Clockville Creek. Perhaps one of the most underutilized trout fishing opportunities lies within the City. Observations at many of the bridge crossings of Canastota Creek revealed that many trout are associated with the scour holes developed around the storm sewers. No angling for these fish or evidence of previous angling efforts was observed. Another likely underutilized area on Canastota Creek is the area associated with the Link Trail located south of the City. Better parking and signage could increase the use of this area.

BARRIERS TO FISH PASSAGE

Fish movements in a waterbody are influenced by a number of factors. Access to spawning, nursery, foraging, and overwintering areas can be important aspects to the life history strategies of fish. Time of year, water temperature and quality, and habitat availability affect the timing of such movements. Within the Cowaselon Creek watershed, the lower portions of the Cowaselon and Canaseraga Creeks are seasonally closed to fishing to allow for walleye spawning to occur. Survey conditions during their early spring spawning runs were not conducive to rigorous sampling due to the high water levels within the Douglas Ditch. Northern pike and white suckers are also spring spawners, with yellow perch spawning soon afterwards. Numerous white suckers in spawning condition were collected from the Douglas Ditch downstream of the Tackberry/Indian Opening Road.

Water velocities increase at the existing bridge crossings of the Douglas Ditch due to elevational differences above and below these structures. Portions of the streambed and banks have been "hardened" through the use of concrete rubble (See **Appendix 3**, **Photo 12**). However, these velocities do not appear to preclude the upstream movements of spring spawning fish. Overall, observations of the watershed's bridges and culverts did not appear to pose barriers to fish passage. However, one potential barrier on Canaseraga Creek exists at the Tag Road crossing. As water levels dropped, the NYSDEC reported that walleye appeared to be trapped in a riprapped sill located to the north of the road (personal communication, Jeff Robins, NYSDEC, Cortland, NY). Two segments of Canastota Creek in the City were placed in underground culverts: one section is located in the vicinity of a public swimming pool/recreation area and the other segment is where the creek passes under the old Erie Canal. The potential for these areas to deter or restrict passage was not evaluated.

Spawning access for northern pike from Oneida Lake was investigated. This fish spawns in flooded vegetation and wetland areas. Such wetlands may provide nursery areas for young-of-the-year fish during the spring and summer. In the fall, these young fish may leave the area for larger waterbodies. Many of the area's wetlands associated with the mucklands have been ditched. These ditches drain the area for agricultural purposes. The ditching is so extensive that a series of laterals forms a large network which effectively drains much of the area (See **Figure 1**). These laterals were considered as potential locations to access remaining or restored wetlands. However, these laterals were found to be perched above the Douglas Ditch and armored with concrete and rock to reduce the erosional force caused by water exiting the lateral and entering the Douglas Ditch (See **Appendix 3**, **Photos 11**, **13** and **14**). Even if the vertical distance could be surmounted, the laterals do not appear to maintain a sufficient volume of water over an extended period of time to allow fish to fully complete their life history requirements. Future wetland restoration projects, located in close proximity to the Douglas Ditch or Canaseraga Creek, should consider design features which may provide wetland access for northern pike spawning and rearing.

Access for trout was not considered a priority for the watershed. Gradient and elevational change which pose barriers to many species of fish are often overcome by the leaping abilities of trout. Historically and presently, brown trout are stocked in selected locations within the watershed. However, they have moved extensively throughout the area and are now self-reproducing resident species in much of the watershed.

CONCLUSIONS AND RECOMMENDATIONS

The fisheries of the Cowaselon Creek watershed are reflective of its geography and its influences from human alterations. The streams located within the escarpment and headwaters are of steep to moderate gradient and possess cold water fisheries. However, it is likely that the native brook trout has been displaced by brown trout in many areas assisted by long-term recreational stocking efforts. The resulting fishery appears to provide an acceptable angling opportunity. No PFR have been purchased by the NYSDEC within the watershed and at present angler access has been adequate (personal communication, Jeff Robins, NYSDEC, Cortland, NY). However, land use and ownership may change over time affecting angler access. Therefore, provisions for future PFR should be considered. In addition, fishing opportunities along the Link Trail System could be promoted to encourage use of the existing public properties.

Warm water fish species from Oneida Lake have access to the lowland segments of Canaseraga and Cowaselon Creeks. However, many of the stream segments have been significantly altered

by wetland drainage projects designed to promote agricultural activities and control water runoff patterns. These modifications have severely altered aquatic habitat conditions. Maintenance activities, such as the removal of vegetation from along the ditch banks, continue to affect these habitats through the loss of woody debris inputs and the loss of shade producing canopies. Plantings of low-growing shrubs and grasses could be utilized to maintain the ditch configuration while providing for the movement of terrestrial insects into the aquatic food web. Such planting could reduce the frequency of vegetative control. Further, the selective input of woody debris could locally improve aquatic habitats which may also serve as fish attractors for angler use.

Access to the Douglas Ditch is readily available from Ditch Bank Road by parking along the shoulder. However, developing designated parking areas could improve safety and avoid blocking access to private properties. Safe access to this area by physically challenged anglers may be hindered by the steep banks. Therefore, local planners should consider providing one to two improved angler access areas to encourage use of the public waterway. Further, access to the lower portions of Canaseraga Creek downstream of the Douglas Ditch would provide anglers with the opportunity to fish in a more natural setting with less altered aquatic habitats. Development of a local trail with a parking area should be considered to improve public use of the area.

Finally, as discussed in the previous section, *Barriers to Fish Passage*, the present access to wetland spawning areas has been severely altered by the existing drainage infrastructure. However, future wetland restoration projects should consider design features which may provide wetland access for northern pike spawning and rearing.

REFERENCES

Connelly, Nancy A., Tommy L. Brown, and Barbara A. Knuth. 1997. New York Statewide Angler Survey 1996, Report 1: Angler Effort and Expenditures. October 1997. New York State Department of Environmental Conservation, Albany, NY.

Hanna, W.E. 1981. Soil Survey of Madison County, New York. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Cornell University Agricultural Experiment Station.

Kraft, C.E., D.M. Carlson, and S.C. Brown. 2003. *The On-line Fishes of New York State, Version 2.1*. Department of Natural Resources, Cornell University, Ithaca, NY.

Madison County Planning Department. 2001. The Cowaselon Creek Watershed Area Agricultural Protection and Wetland Restoration Project. Madison County (NY) Planning Department. March 2001.

Moore, Emmeline. 1928. A Biological Survey of the Oswego River System - Supplemental to the Seventeenth Annual Report, 1927. State of New York Conservation Department. J.B. Lyon Company, Printers, Albany, NY.

New York State Department of Environmental Conservation. 1996. Priority Water Problem List. Region 6. New York State Department of Environmental Conservation, Division of Water, Albany, NY.

Rosgen, Dave. 1996. <u>Applied River Morphology</u>. Wildland Hydrology, Pasoga Springs, CO.

Appendices